

a

~~Patent claims~~

We Claim

1. A laser diode with a vertical resonator, characterized by a means for shaping the beam profile of the laser diode, the means having at least one decoloring absorber means (5) in the vertical resonator.
2. The laser diode as claimed in claim 1, characterized by at least one pn junction of III-V or II-VI compound semiconductor material.
3. The laser diode as claimed in claim 1 or 2, characterized in that at least one absorber means (5) is monolithically integrated into a series of layers.
4. The laser diode as claimed in claim 3, characterized in that at least one absorber means (5) is arranged in the Fabry-Perot resonator of the series of layers.
5. The laser diode as claimed in at least one of the preceding claims, characterized in that at least one absorber means (5) is arranged outside the depletion zone of the pn junction.
6. The laser diode as claimed in at least one of the preceding claims, characterized in that at least one absorber means (5) is formed as a layer in the vertical resonator, the thickness of the layer being small, approaching a quarter of the material wavelength.
7. The laser diode as claimed in at least one of the preceding claims, characterized in that at least one absorber means (5) is formed as a layer with the thickness of the layer being greater than a quarter of the material wavelength.

8. The laser diode as claimed in at least one of the preceding claims, characterized in that at least one absorber means (5) has a means for current constriction, in particular by a combination of the medium of the absorber means with an oxide aperture or proton implantation.

9. The laser diode as claimed in at least one of the preceding claims, characterized by two electrical supply leads, one for the p contact and one for the n contact.

10. The laser diode as claimed in at least one of the preceding claims, characterized by a current constricting means (53) in the vertical resonator.

11. The laser diode as claimed in at least one of the preceding claims, characterized in that at least one reflector layer (2, 6) has a relief structure, in particular a Fresnel lens, to improve the mode selection.

12. The laser diode as claimed in at least one of the preceding claims, characterized in that at least one spacer layer is arranged in the vertical resonator, in particular between the absorber layer 50 and the active zone 4.

13. The laser diode as claimed in at least one of the preceding claims, characterized in that at least one layer of the vertical resonator consists of GaAsN or InGaSbP.

14. An optical system, in particular a CD player or a data transmission system, with at least one laser diode as claimed in at least one of claims 1 to 13.

add  
a7